

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chan et al.
Serial No: Not yet assigned
Confirmation No:
Filed: Herewith
For: METHODS AND APPARATUSES FOR STRETCHING
POLYMERS

Examiner:
Art Unit: Not yet assigned

Mail Stop Patent Application
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

STATEMENT FILED PURSUANT TO THE DUTY OF
DISCLOSURE UNDER 37 CFR §§1.56, 1.97 AND 1.98

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. §§1.56, 1.97 and 1.98, the Applicant requests consideration of this Information Disclosure Statement.

Compliance with 37 C.F.R. §1.97

This Information Disclosure Statement has been filed before the mailing date of a first Office Action on the merits in the above-identified case.

No fee or certification is required.

Information Cited

The Applicant hereby makes of record in the above-identified application the information listed on the attached form PTO-1449 (modified). The order of presentation of the references should not be construed as an indication of the importance of the references.

The following are remarks concerning the other information cited:

Remarks

Documents cited anywhere in the Information Disclosure Statement are enclosed unless otherwise indicated. It is respectfully requested that:

1. The Examiner consider completely the cited information, along with any other information, in reaching a determination concerning the patentability of the present claims;
2. The enclosed form PTO-1449 be signed by the Examiner to evidence that the cited information has been fully considered by the Patent and Trademark Office during the examination of this application;
3. The citations for the information be printed on any patent which issues from this application.

By submitting this Information Disclosure Statement, the Applicant makes no representation that a search has been performed, of the extent of any search performed, or that more relevant information does not exist.

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, material to patentability as defined in 37 C.F.R. §1.56(b).

By submitting this Information Disclosure Statement, the Applicant makes no representation that the information cited in the Statement is, or is considered to be, in fact, prior art as defined by 35 U.S.C. §102.

Notwithstanding any statements by the Applicant, the Examiner is urged to form his own conclusion regarding the relevance of the cited information.

An early and favorable action is hereby requested.

Respectfully submitted,
Chan et al., Applicants

By: 

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Docket No. C0989.70030US01
Date: February 10, 2004

FORM PTO-1449/A and B (Modified) INFORMATION DISCLOSURE STATEMENT BY APPLICANT				APPLICATION NO.: Not yet assigned		ATTY. DOCKET NO.: C0989.70030US01	
				FILING DATE: Herewith		CONFIRMATION NO.:	
				APPLICANT: Chan et al.			
				GROUP ART UNIT: Not yet assigned		EXAMINER: Not yet assigned	
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U.S. PATENT DOCUMENTS

Examiner's Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication or of issue of Cited Document MM-DD-YYYY
		Number	Kind Code		
	*	60/149,020		Chan et al.	08-13-1999
	*	09/374,902		Gilmanshin et al.	08-13-1999
	*	09/373,822		Tegenfeldt et al.	08-13-1999
	*	60/120,414		Tegenfeldt et al.	02-14-1999
	*	60/096,544		Tegenfeldt et al.	08-13-1998
	*	09/134,411		Chan	08-13-1998
	*	5,851,769		Gray et al.	12-22-1998
	*	5,846,724		Bensimon et al.	12-08-1998
	*	5,840,862		Bensimon et al.	11-24-1998
	*	5,837,115		Austin et al.	11-27-1998
	*	5,795,782		Church et al.	08-18-1998
	*	5,707,797		Windle	01-13-1998
	*	5,599,664		Schwartz	02-04-1997
	*	5,538,898		Wickramasinghe et al.	07-23-1996
	*	5,427,663		Austin et al.	06-27-1995
	*	5,356,776		Kambara et al.	10-18-1994
	*	5,079,169		Chu et al.	01-07-1992
	*	5,846,832		Oefner et al.	12-08-1998

FOREIGN PATENT DOCUMENTS

Examiner's Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document (not necessary)	Date of Publication of Cited Document MM-DD-YYYY	Translation (Y/N)
		Office/ Country	Number	Kind Code			
	*	WO	00/09757		PCT	02-24-2000	
	*	WO	98/35012		PCT	08-13-1998	
	*	WO	97/06278		PCT	02-20-1997	
	*	WO	93/22463		PCT	11-11-1993	
	*	EP	0391674		EPO	10-10-1990	

OTHER ART — NON PATENT LITERATURE DOCUMENTS

Examiner's Initials	Cite No	Include name of the author (in CAPITAL LETTERS) title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, relevant page(s), volume-issue number(s), publisher, city and/or country where published.	Translation (Y/N)
	*	PCT International Search Report, (December 27, 2000).	
	*	AUSTIN, et al., "Stretch Genes," Physics Today (1997), Vol. 50, pp. 32-38.	
	*	AUSTIN, et al., "Electrophoresis and Microlithography," (1993), Analysis Vol. 21, pp. 235-238.	
	*	BAKAJIN, et al., "Electrohydrodynamic Stretching of DNA in Confined Environments," (March 23, 1998), Phys. Rev. Lett. Vol. 80, No. 12, pp. 2737-2740.	
	*	BENSIMON, et al., "Stretching DNA with a Receding Meniscus: Experiments and Models," (1995), Phys. Rev. Lett. Vol. 74, pp. 4754-4757.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT				APPLICATION NO.: Not yet assigned		ATTY. DOCKET NO.: C0989.70030US01	
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Sheet	2	of	3				

OTHER ART — NON PATENT LITERATURE DOCUMENTS

	*	BENSIMON, et al., "Alignment and Sensitive Detection of DNA by a Moving Interface," (1994), Science Vol. 265, pp. 2096-2098.		
	*	BUSTAMANTE, et al., "Entropic Elasticity of Lambda-phage DNA," (1994), Science Vol. 265, pp. 1599-1600.		
	*	CHOU, et al., "A Microfabricated Device for Sizing and Sorting DNA Molecules," (1999), Proc. Natl. Acad. Sci. USA. Vol. 96, pp. 11-13.		
	*	CHU, "Laser Manipulation of Atoms and Particles," (1991), Science Vol. 253, pp. 861-866.		
	*	CLUZEL, et al., "DNA: An Extensible Molecule," (1996), Science Vol. 271, pp. 792-794.		
	*	DEEN, "Analysis of Transport Phenomena," (1998), Oxford University Press, NY, pp. 275-278.		
	*	DUKE, et al., "Microfabricated Sieve for the Continuous Sorting of Macromolecules," (1998), Phys. Rev. Lett. Vol. 80, pp. 1552-1555.		
	*	ERTAS, "Lateral Separation of Macromolecules and Polyelectrolytes in Microlithographic Arrays," (1998), Phys. Rev. Lett. Vol. 80, pp. 1548-1551.		
	*	FISHER88, Fisher Scientific Catalog (1988) p. 861		
	*	GRANDBOIS, et al., "How Strong is a Covalent Bond?" (1999), Science Vol. 283, pp. 1727-1730.		
	*	HARRISON, et al. "Capillary Electrophoresis and Sample Injection Systems Integrated on a Planar Glass Chip." (1992), Anal. Chem. Vol. 64, pp. 1926-1932.		
	*	HATFIELD, et al., "Dynamic Properties of an Extended Polymer in Solution," (1999), Phys. Rev. Lett. Vol. 82, pp. 3548-3551.		
	*	HOUSEAL, et al., "Real-time Imaging of Single DNA Molecules with Fluorescence Microscopy," (1998), Biophys. J. Vol. 56, pp. 507-516.		
	*	JACOBSON, et al., "Fused Quartz Substrates for Microchip Electrophoresis," (1995), Anal. Chem. Vol. 67, pp. 2059-2063.		
	*	KABATA, et al., "Visualization of Single Molecules of RNA Polymerase Sliding Along DNA," (1993), Science Vol. 262, pp. 1561-1563.		
	*	KIM, et al., "Intermediates in the Folding Reactions of Small Proteins," (1990), Annu. Rev. Biochem. Vol. 59, pp. 631-660.		
	*	LYON, et al., "Confinement and Detection of Single Molecules in Submicrometer Channels," (1997), Anal. Chem. Vol. 69, pp. 3400-3405.		
	*	MARKO, et al., "DNA Under High Tension: Overstretching, Untwisting, and Relaxation Dynamics," (1998), Phy. Rev. E. Vol. 27, pp. 2134-2149.		
	*	MARKO, et al., "Stretching DNA," (1995), Macromolecules Vol. 28, pp. 8759-8770.		
	*	PARRA, et al., "High Resolution Visual Mapping of Stretched DNA by Fluorescent Hybridization," (1993), Nature Genet Vol. 5, pp. 17-21.		
	*	PERKINS, et al., "Direct Observation of Tube-like Motion of a Single Polymer Chain," (1994), Science Vol. 264, pp. 819-822.		
	*	SCHMALZING, et al., "DNA Sequencing on Microfabricated Electrophoretic Devices," (1998), Anal. Chem. Vol. 70, pp. 2303-2310.		
	*	SCHMALZING, et al., "DNA Typing in Thirty Seconds with a Microfabricated Device," (1997), Proc. Natl. Acad. Sci. USA Vol. 94, pp. 10273-10278.		
	*	SCHWARTZ, et al., "Ordered Restriction Maps of <i>Saccharomyces Cerevisiae</i> Chromosomes Constructed by Optical Mapping," (1993), Science Vol. 262, pp. 110-114.		
	*	SCHWARTZ, et al., "Conformational Dynamics of Individual DNA Molecules During Gel Electrophoresis," (1989), Nature Vol. 338, pp. 520-522.		
	*	SEILER et al., "Planar Glass Chips for Capillary Electrophoresis: Repetitive Sample Injection, Quantitation and		

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Sheet	3	of	3						

		Separation Efficiency,” (1993), Anal. Chem. Vol. 65, pp. 1481-1488.		
	*	SMITH et al., “Single-Polymer Dynamics in Steady Shear Flow,” (1999), Science Vol. 283, pp. 1724-1727.		
	*	SMITH, et al., “Response of Flexible Polymers to a Sudden Elongational Flow,” (1998), Science Vol. 281, pp. 1335-1340.		
	*	SMITH, et al., “Direct Mechanical Measurements of the Elasticity of Single DNA Molecules by Using Magnetic Beads,” (1992), Science Vol. 258, pp. 1122-1126.		
	*	SMITH, et al., “Observation of Individual DNA Molecules Undergoing Gel Electrophoresis,” (1989), Science Vol. 243, pp. 203-206.		
	*	TAN, et al., “Nanoscale Imaging and Sensing by Near-Field Optics, in: <u>Fluorescence Imaging: Spectroscopy and Microscopy</u> ,” (1996), Wang and Herman eds., Chem. Anal. Series Vol. 137, pp. 407-475.		
	*	VOLKMUTH, et al., “DNA Electrodifffusion in a 2D Array of Posts,” (1994), Phys. Rev. Lett. Vol. 72, pp. 2117-2120.		
	*	VOLKMUTH, et al., “DNA Electrophoresis in Microlithographic Arrays,” (1992), Nature Vol. 358, pp. 600-602.		
	*	WASHIZU, et al., “Applications of Electrostatic Stretch-and-Positioning of DNA,” (1995), IEEE Trans. Industry Applications Vol. 31, pp. 447-456.		
	*	WASHIZU, et al., “Electrostatic Manipulation of DNA in Microfabricated Structures,” (1990), IEEE Trans. Industry Applications Vol. 26, pp. 1165-1172.		
	*	WOOLLEY, et al., “Ultra-high Speed DNA Fragment Separations Using Microfabricated Capillary Array Electrophoresis Chips,” (1994), Proc. Natl. Acad. Sci. USA Vol. 91, pp. 11348-11352.		
	*	ZIMMERMAN, et al., “DNA Stretching on Functionalized Gold Surface,” (1994), Nucl. Acids Res. Vol. 22, pp. 492-497.		

EXAMINER	DATE CONSIDERED
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#EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

*a copy of this reference is not provided as it was previously cited by or submitted to the office in a prior application, Serial No. 09/636,793 , filed August 11, 2000 , and relied upon for an earlier filing date under 35 U.S.C. 120 (continuation, continuation-in-part, and divisional applications).

[NOTE - Must provide a copy of any patent, publication, other information listed, even if it was previously submitted to, or cited by, the U.S. Patent Office in an earlier application, unless the earlier application is identified by the IDS and is relied upon for an earlier filing date under 35 U.S.C. §120, and the copy was provided in the earlier application.]